

Analysing Access Requirements

These Student Notes are produced as a supplement to their own notes and any text book recommended or issued. These notes do not form a conclusive reference and are intended to be used in context with the course.

ANALYSING ACCESS REQUIREMENTS

INTRODUCTION

The Entity Model and the normalised data structures show the file store structures at the logical level. The designer will use these as the basis for file design. They show the designer the relationships between the structures.

However, the designer will be interested in all the access requirements. These accesses are described in the Mini-Specs and their occurrence is shown in the Process-File Structure chart, the Data Access Diagram is a graphic way of presenting them to the designer and to the users.

The construction of a Process-file Structure chart and the drawing of a Data Access Diagram also validates the Entity Model, it is a check that it is possible to access a structure with a particular data item.

PROCESS-FILE STRUCTURE CHART

This chart allows the designer to examine the relationships between processes which 'act on' the data, and the data stores. The chart is a grid that shows the 3NF structures across the top and the lowest level process names listed down the side. The lowest level processes are the mini-specs. Not only are the operational processes, those defined in the mini-specs of the system model, but also any *ad hoc* enquires of the system, ie informational processes. The next stage of building the chart is to examine each process mini-spec and find out:

- * which file structures are accessed
- * what key or keys are used for the access

The access is then marked on the chart against the structure accessed. If the access key is the key to the structure, a tick is entered, if not, the access key is written into the chart. Every access made in every mini-spec must be entered on the chart. The Informational processes are dealt with in the same way, identifying each access and method of access.

When the chart is complete it can be used to assist in the building of the Data Access Diagram.

The following example shows a Process-File Structure chart for a Project personnel system.

FILE/KEY SET	PROJECT Project No.	CLIENT Client No.	EMPLOYEE Personnel No.	PROJECT ASSIGNMENT DETAIL Project No. & Personnel No.	SALARY INCREMENT DETAIL Personnel No. & Date of increment	EMPLOYEE TRAINING DETAIL Personnel No. & Training Inst.
<u>OPERATIONAL</u>						
Create new project	T					
Assign staff to project	T		Name of Employee	T		
Amend staff record			Name of Employee		T	T
Produce project analysis	T	T	T	Project No.	Personnel No.	
Produce employee analysis	T		T	Personnel No.	Personnel No.	
<u>INFORMATIONAL</u>						
Employee ÿ project				Personnel No.		
Client ÿ project	Client No.	T		Project No.	Personnel No.	

DATA ACCESS DIAGRAM

Drawing a Data Access Diagram (DAD)

As stated previously, the Data Access Diagram is a graphical way of show what key (set) is used to access which files. It is similar to an Entity Model, which is used as the starting point.

Redraw the Entity Model without the lines but with a strip in each rectangle showing the key of the structure - see Figure 1.

Direct access to any structure is possible via its primary key.

Work through the mini-specs and the Process-File Structure chart to identify all the accesses. Draw

arrows in the direction of the access. Arrows may go both ways between entities. In Figure 2 there are accesses going both ways between the entities LIBRARY and BORROWER.

If the access is not on the full key but on part of the key write in the access key beside the line. In Figure 3 there are many examples of these e.g. access to BORROWED BOOK on Book Title only.

If the access key is not on part of the key but on a non-key data element write this beside the line with a circle around it. In Figure 4 access to LIBRARY BOOK and BOOK via Subject is an example of this.

When finished the DAD shows the complete access picture and forms the scheme for database/file design.

SUMMARY

Data access analysis is carried out when the logical design of the new system is near completion. At least the following tasks must have been carried out:

- 3nf relationships formed to define logical data structures;
- all DFD's and supporting procedure specifications (mini-specs) must have been created;
- all informal query information requirements have been defined.

There are three main reasons for carrying out Data Access Analysis:

- provides an aid to analysis;
- provides an aid to design;
- provides an aid to communication between analyst, designer and users.

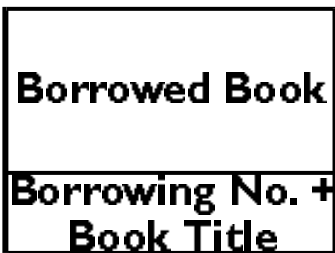
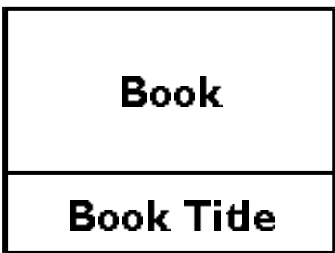
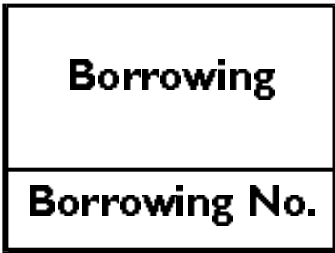
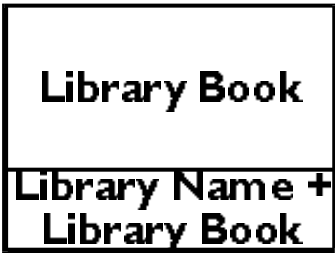
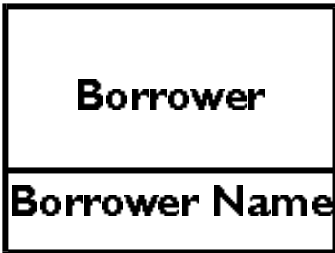
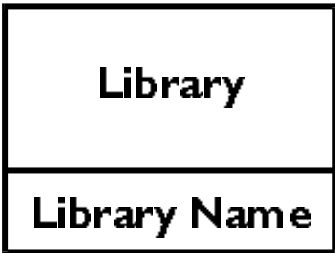


Figure 1

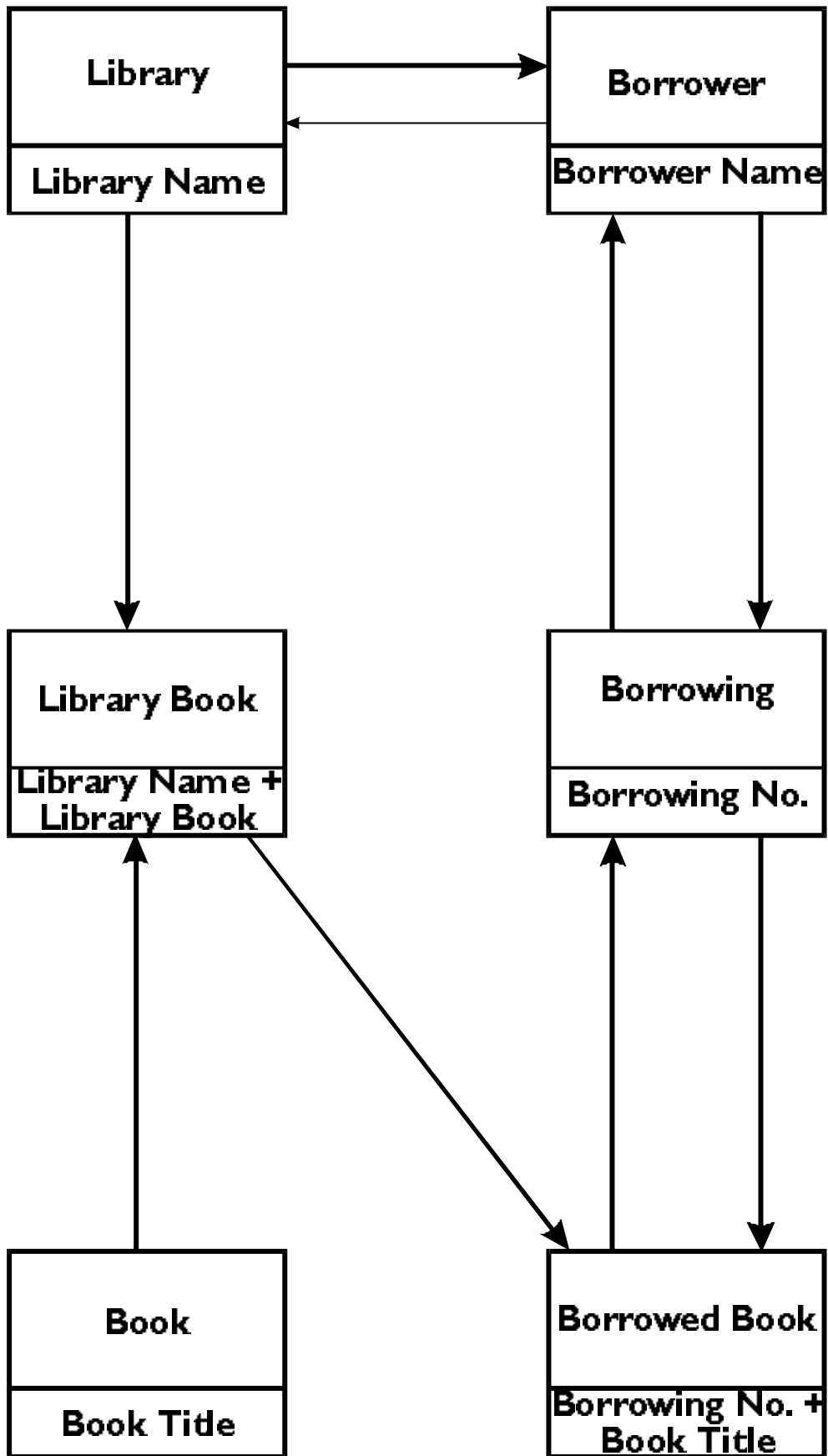


Figure 2

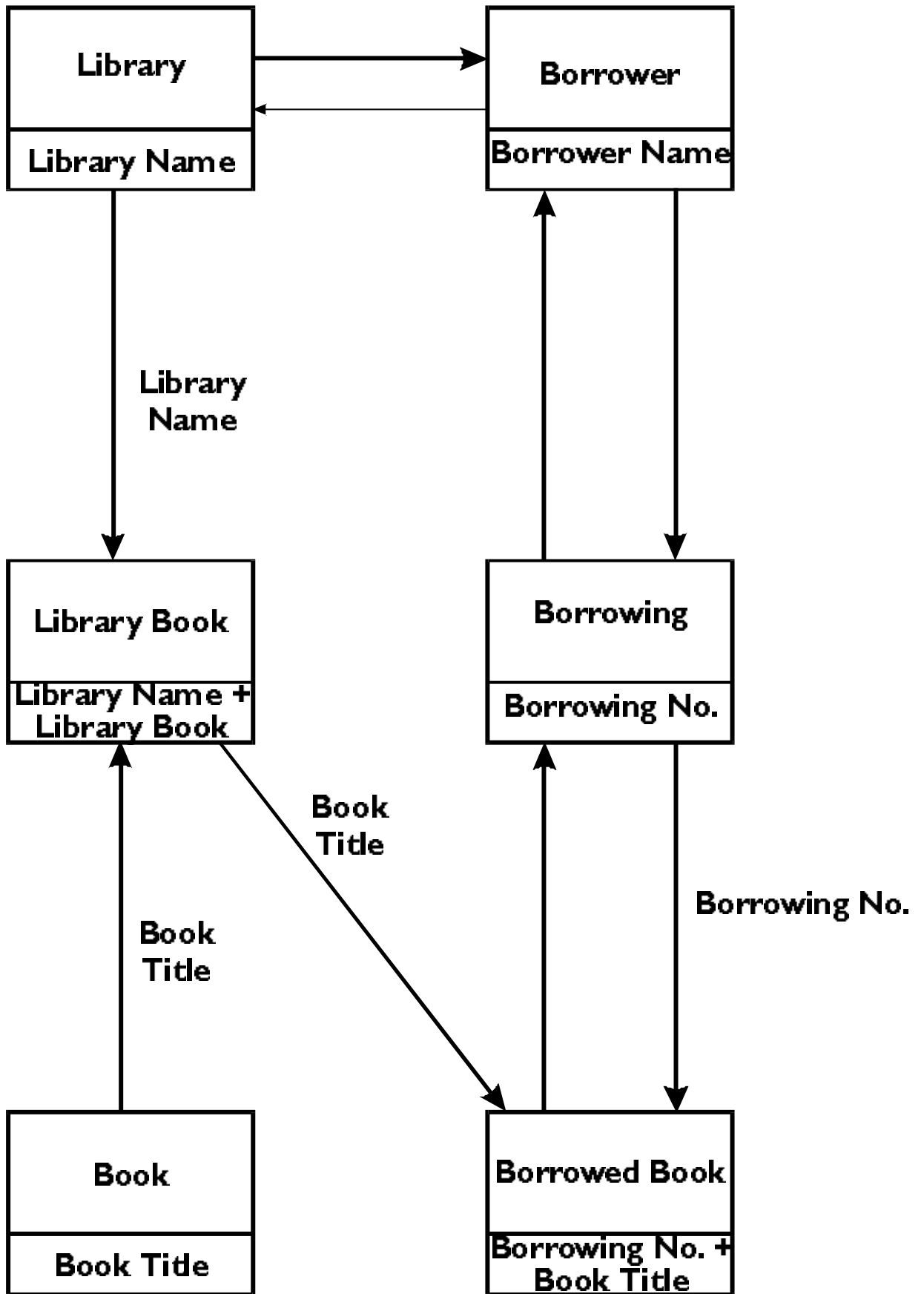


Figure 3

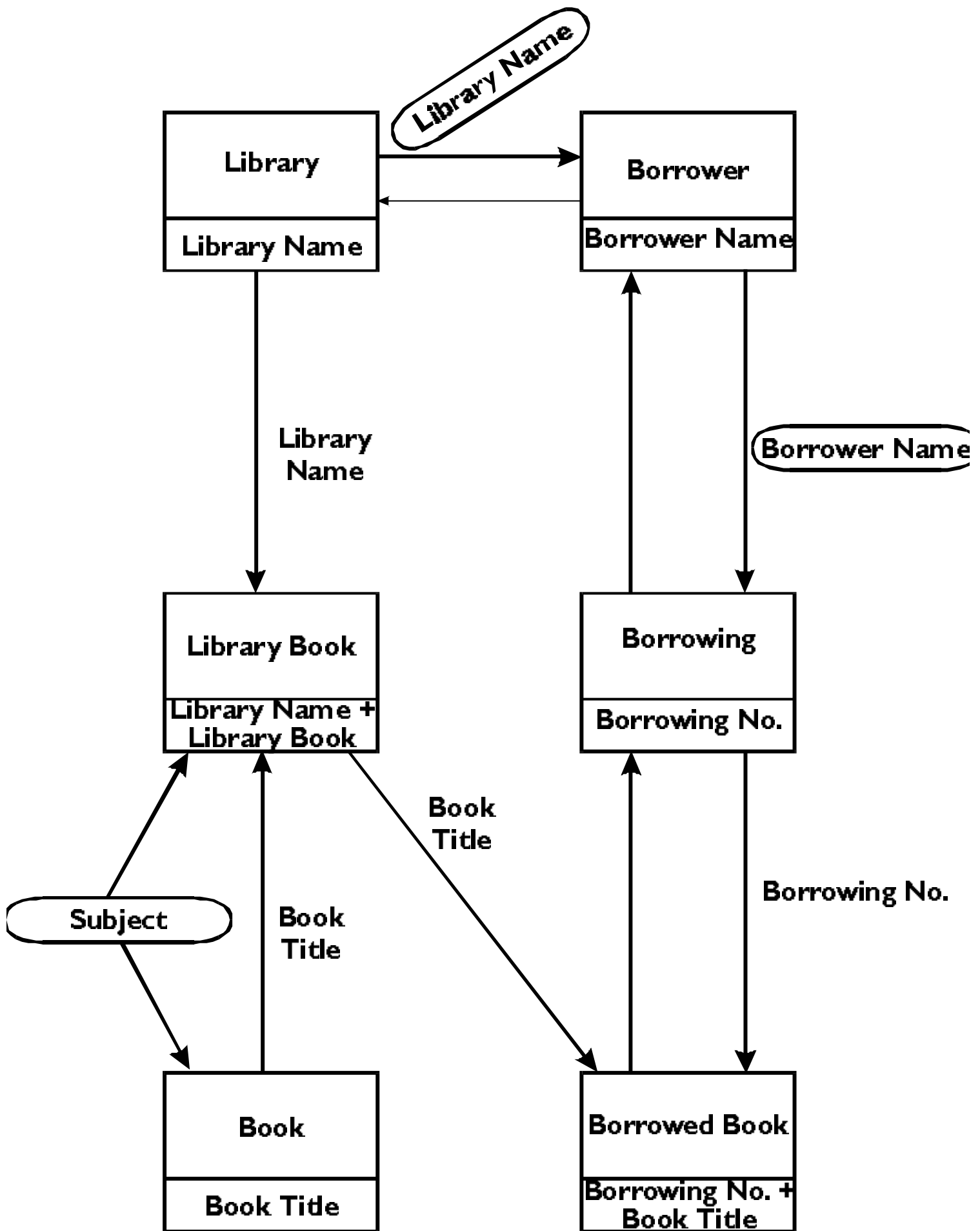


Figure 4